Pruning Ornamentals

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PRUNING ORNAMENTALS

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INTRODUCTION

The pruning of ornamental trees, shrubs, and vines is done by a large number of homeowners and others. This publication provides the information about the basic reasons for pruning, as well as the techniques employed to obtain desired results.

Pruning is a very old horticultural practice. It might be thought that the reasons for doing it, and the best procedures to follow, would be well understood and carried out. Unfortunately, pruning is too often done in ways that are neither wise nor skillful. Improper pruning may result in more harm than good; in fact, it may be better in many cases not to prune than to prune without specific objectives and a reasonably clear idea of the results that will be obtained

Pruning is not the only means by which the growth of woody plants may be corrected or improved. Many other cultural considerations must be taken into account. For example, pruning does not make up for deficiencies or excesses in drainage or soil fertility, or for poor soil structure. In some cases the pruning operation should be followed by the application of fertilizers and water; in others it may be desirable to withhold both.

Sometimes the removal of diseased or insect-infested branches maybe of little value unless the remaining parts are sprayed to prevent further outbreaks. Therefore, pruning must be considered to be just one of many practices in the overall culture of plants.

Why Prune?

Pruning requires decisions based upon a basic conception of the growth of plants. Growth is accomplished by the absorption of minerals in solution which, when transported to the leaves, are combined with carbohydrates (formed through photosynthesis) to produce proteins and other plant foods. Therefore, reduction of the leaves, or leaf-bearing parts, reduces the amount of plant food manufactured and so reduces the total growth. Although the immediate effect of pruning may be to increase the length of new shoots and the size of the leaves in the immediate vicinity of the cut; the total size, weight and trunk circumference are greatest with least pruning. So in the long run, any pruning is a dwarfing process.

Pruning in late winter while the plant is dormant produces vigorous shoot growth when the buds burst in spring. The reason for this is that there has been a reduction in top growth but there is a full complement of roots producing a flow of sap capable of supplying more tissue than is now available. Therefore, vigorous growth results in the shoots arising from buds immediately below the pruning wound.

Pruning in summer or when the plant is in full leaf does not produce a similar result. There has been a reduction in the number of leaves and this reduces the supply of food so that the new growth produced is not so vigorous. Severe pruning, although it may bring about immediate localized stimulation, is a practice that inhibits growth. Where pruning is employed judiciously its value as a growth corrective practice outweighs any growth inhibition it may cause.

Following are some of the reasons for pruning: (1) to help plants recover from injury to the roots following transplanting; (2) to remove or restrict unwanted growth; (3) to encourage or train growth where it is desired; (4) to remove dead or injured wood and to repair damage; (5) to alter form, as in standards or hedges; (6) to rejuvenate old shrubs; and (7) to promote bloom, fruit production, colorful twigs or foliage. In short, it is to promote healthy growth suitable for the purpose for which the plants are grown, whether this is for ornamental effect, fruit production or for screening and shelterbelt functions.

Pruning for Appearance

Since ornamental trees and shrubs are grown for beauty, shade, and privacy, good appearance must be maintained. If pruning is properly done it is a very useful aid in attaining this objective.

One of the first steps in pruning established plants is to remove broken, dead and diseased branches. Although broken wood may heal if properly treated, dead and diseased branches are neither useful nor ornamental and eventually they become a hazard to the rest of the plant. Such wood may be removed at any season of the year.

The practice of clipping and shearing shrubs to the all too familiar globe shape is a common sight. However, it is a bad practice both from pruning and decorative viewpoints. When this form is wanted, it is better to grow shrubs well-adapted to this shape rather than attempt to achieve it by excessive and indiscriminate shearing.

Improving the form or shape adds to the appearance or beauty of the plant. Lopsided and unbalanced trees or shrubs often spoil the appearance of any landscape planting. In modifying the form of a plant, one should be familiar with its natural shape and should not, for example, train a maple to the shape of a Linden, or a spirea like a lilac. Form, growth and flowering habit should be studied so that the natural shape is not spoiled and that the best appearance is obtained consistent with the use of the plant.

Shrubs that are valued for the color of their twigs may be kept attractive by pruning. For example, the younger wood of the red-stemmed dogwood or willows with brightly colored stems is more striking in effect than older wood. A supply of younger growth is obtained by cutting the plants back to stubs each year in spring prior to active growth.

The same practice is sometimes applied to Catalpa to encourage young growth with very large leaves and thus achieve a subtropical effect. Dogwoods with variegated foliage should not be pruned quite so heavily; rather, old canes should be thinned out each year to ensure a supply of young wood.

An important purpose of pruning many kinds of plants is to obtain the maximum display of bloom, and to increase the size of flowers and fruits without causing too great a reduction in total quantity. This may be accomplished by removing very old, thin, weak wood, and retaining vigorous, healthy stems. It is possible to develop larger flowers on longer stems by reducing the number of buds on shrubs which produce their flowers on shoots of the current season (e.g. Hydrangea). This is commonly known as disbudding but it is essentially a pruning practice.

The removal of the faded blooms from rose plants is another similar operation by which new flowering is encouraged; the object in this case is to lengthen the season of bloom as well as to produce a tidy appearance.

Shy blooming may be caused by a number of conditions that pruning cannot correct; in fact, in some cases, pruning may aggravate the condition, and by promoting shoot vigor it may further retard flowering. However, if the lack of bloom is due to old and dense growth, thinning out the old wood helps to rejuvenate the plants which will then "settle down" to improved flowering. Where lack of bloom is caused by excessively vigorous growth, due to high fertility and abundance of moisture, withholding fertilizers and water should be tried.

Balance Vigour Within The Crown

Some of the energy of the more vigorous parts of a tree or shrub can be redirected to less vigorous branches by means of pruning. Sometimes an especially vigorous branch tends to compete with the leader, but cannot be removed entirely because the branch is required to maintain a balanced framework within the top. Often, in such cases, the dominance of the leader can be ensured by merely removing the tip of the competing branch; however, restoration of balance with other branches will normally require further shortening of strong-growing main shoots where these must be reduced to side branch status.

Water sprouts from the branches, although they may sometimes be used to advantage in renewing portions of the top, are undesirable responses to diverting the energy of a plant from one growing point to another. Their presence usually indicates that previous pruning was too severe. They are readily removed by hand pulling while they are in a soft, early-growth stage.

To Control Height and Width

Pruning is a means of limiting the size of trees and shrubs so that they will not become too tall or too wide for the positions they occupy. Some light pruning is justifiable to attain this objective but, if extensive pruning is required, it is an indication that the initial choice was unsuitable.

Foundation plantings around houses and other buildings are often planted too close so that they become overcrowded in a few years. Attempts to control growth by pruning heavily at this stage is usually unsatisfactory; to avoid spoiling the plants, it is generally best to remove some of them and to rearrange the remaining specimens. This also applies to group plantings of shrubs and to shrub borders. However, occasional pruning, when required, serves to ensure balanced growth and better proportion in landscape effects and may, for a time, delay the necessity for thinning out or complete replanting.

It is often necessary to remove low branches on street trees, or on trees in lawns and parks, so that they will not interfere with traffic or be a hazard to persons

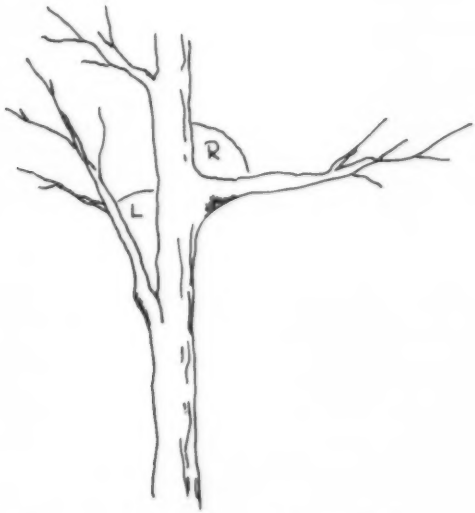

Figure 1. Narrow-angled, weak crotch (L) Wide-angled strong crotch (R)

walking under them. It is better to remove low branches at planting time when the original framework and height of trunk is determined so that cutting off large branches, with consequent large wounds, can be avoided later. Allowing clearance for utility wires can also be a reason for pruning, but could be avoided by planting small trees, specific structural forms, or by locating them so that branches do not reach the wires.

To Increase Structural Strength

Pruning to increase structural strength should start when a tree is young or soon afterwards, or at any time later to remove narrow forks higher in the top. Narrow or Y-angled crotches are undesirable from the standpoint of the structural strength of a tree. When a crotch is wide-angled, the branch will support a greater weight of snow or ice without breaking.

Weak crotches can sometimes be corrected by cutting out one or other of the competing branches in the "Y" in a recently planted tree. Though there may be a crook in the trunk for a time, subsequent growth will usually correct this. Suppressing a large branch is often better than removal because it avoids leaving large scars on the upper side of a limb when half of a fork is removed.

Renewal or Rejuvenation

When shrubs are neglected for several years they present a much more complex problem than those that have received timely pruning. Thinning out old, dense and weak wood allows light penetration and generally improves the plants. Often a three to four-year program of rejuvenation is required removing a third of the old wood each year, until by the fourth year the shrub is completely renewed producing a more uniform crop of flowers and fruit. Shrub roses and shrubs with a definite structure (e.g. Viburnum) can be treated as illustrated. Some shrubs that are vigorous and originate from a crown at soil level may be cut back to within 15 cm of the crown (Figure 2). Forsythia and dogwood fall into this latter group.

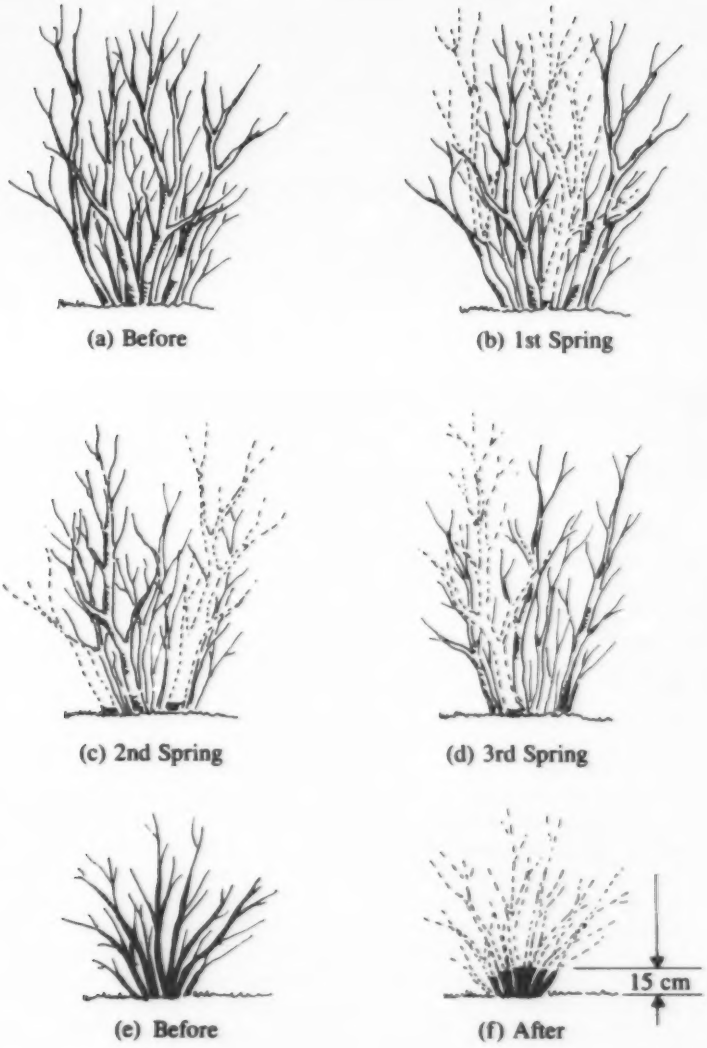

Figure 2. Shrub Pruning (a), (b), (c), (d), Three-year rejuvenation. (e) (f) One year technique.

To Alter Form

A special type of pruning allows certain shrubs to become treelike, when so desired, by training a single stem, e.g., *Viburnum lentago* (Nannyberry), and the standard form of Hydrangea. Conversely, certain kinds of trees may be trained in shrub form for special purposes, e.g., Chinese elm, English beech, and hornbeam are often used as hedges. Other standard forms such as Caragana, weeping mulberry, and flowering almond are produced by budding them high on the stem of a suitable rootstock. However, special pruning is necessary to maintain shape and to prevent them from becoming top-heavy, unbalanced or unsightly.

Another special type of pruning consists of training plant growth in the form of animals, birds, or other figures, for formal gardens. This is known as topiary art. It is a remnant of pre-Victorian garden art and usually it is seen only in very old gardens. Training yew, cedar, boxwood and certain other plants to various shapes or resemblances to animals requires much patience, time, and skill. Shearing alone may not give the desired effect. Some limbs and twigs must be controlled by tying until they remain in the desired position. A variation of this highly specialized practice is used to produce the interesting, very dwarf Bonsai trees familiar in Oriental gardening.

Evergreens

Evergreens, whether or not the term is applied specifically to conifers or to include the deciduous larch and the broad-leaved kinds, constitute a group of plants that may sometimes require pruning to control height, width, and shape. They differ from deciduous plants and from each other in many ways so that a knowledge of the growth habits of each species or cultivar is necessary to produce effective results.

Formal kinds such as globe and pyramid cedars and boxwood may be trimmed in late spring just before growth starts; at this time pruning cuts are covered rapidly by new growth. Cedars may also be trimmed in mid or late summer when growth is completed but no new growth is produced at that time. Mugho pines are often trimmed to ensure compact growth; this is done when the "candle" or new growth is still soft so that new buds will be formed on the sheared or pinched candles. If trimming is delayed until growth has stopped, new buds do not form and unsightly stubs are left.

Spreading evergreens such as some junipers and yews may be pruned lightly to correct wayward growth without spoiling the natural effect. The pruning in this case is selective and should be confined to young wood. If older wood is pruned it should be done in such a manner that stubs are not obvious; this is best done by removing branches cleanly back to the trunk or a side-branch crotch.

Transplants

Pruning at Planting Time

At planting time the gardener wishes to reestablish the plant in the soil so that new root and shoot growth will occur quickly. Proper pruning at this stage often

aids greatly in helping a tree, shrub or vine to survive the disruption and injuries caused by its removal from the nursery and relocation at a new site.

After trees are received for planting, pruning consists of removing damaged or broken roots. Under no circumstances should there be a drastic pruning of the root system to fit a small tree pit; the tree pit should be dug wider than the spread of the major root system.

When trees are being selected for planting choose only those that have been pruned properly so that the trunk is sound and the branches are well placed for future development. This structure should be maintained and kept in the lines of its initial training, although in many cases faulty structure may be corrected by judicious pruning (Figure 3).

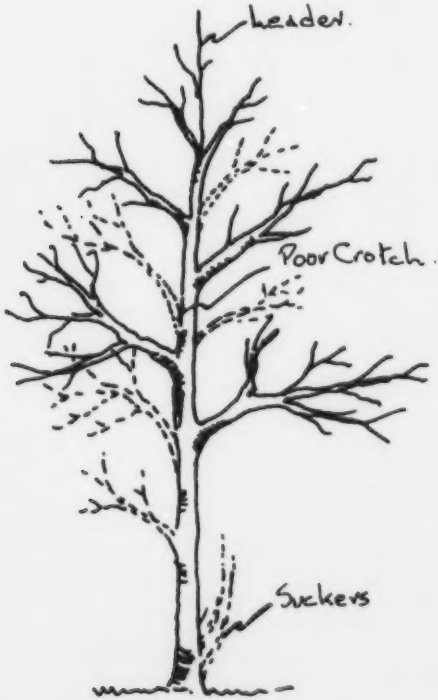

Figure 3. Corrective pruning for future structure.

During the past few years two schools of thought have developed: one advocates the removal of up to one-third of the top growth to reduce transpiration, or moisture loss through the leaves, thus compensating for root loss; the other theory involves the retention of terminal buds which are a source of auxins involved in root initiation, and hence new root growth so critical to the reestablishment of transplants.

Pruning at transplanting time should be kept to a minimum with the removal of broken branches, weak spindly growth and possibly removing or spacing branches to avoid narrow-angled crotches, as these tend to split when branches enlarge.

Trees with definite leaders such as oak, tulip tree, linden and birch are not headed back; however, competing leaders may be removed.

Care should be taken to keep shrubs in their natural form. Some thinning out of branches, as well as moderate heading back, may be helpful, depending on the nature of the plant. Plants for hedges are cut back much more severely at planting time than are shrubs for grouping or for specimen purposes.

Fall-planted trees and shrubs are best pruned the following spring instead of at planting time, especially those species that are not fully hardy. If these plants are pruned in the fall the growth may be reduced still further by winter injury to an extent that the pruner cannot predict. Often, fall pruning proves disastrous, particularly if the winter is severe. If the pruning work is left until spring the wood and buds which have come through the winter alive can be distinguished from dead growth.

Container-grown material including trees, shrubs and evergreens require little pruning at transplant time, other than the removal of branches damaged by handling or in transit. Similarly, ball and burlap, wire basket or mechanically moved plants require minimal pruning, confined to the removal of broken, dead or diseased parts.

When to Prune

There is no specific time of year when all ornamental shrubs, trees and vines should be pruned. The many reasons for pruning vary, and all influence the time when this can be done to best advantage. The nature of the plant itself and the wood on which the flowers, fruits or other ornamental parts are produced varies from shrub to shrub and from tree to tree. The manner of growth and climatic influences must be taken into consideration in order to accomplish the objective with the best possible result. Thus the old adage that "pruning may be done any time the knife is sharp" is no more than a trite remark; to give it credence could result in much damage to valuable plants. Pruning in late summer may encourage new growth that does not mature before winter and is therefore subject to winterkill. Prospective flowering branches may unwittingly be removed if the time factor is

not recognized. However, broken branches should be removed promptly after the breakage occurs. There is little reason to delay such work; in fact, leaving broken branches on trees may be dangerous to pedestrians and a clean cut heals more readily than does mangled tissue. In budded or grafted specimens, sucker growths from the rootstock should be eliminated as soon as noticed.

Some pruning each year is essential for some kinds of plants but in certain cases pruning at 2 or 3 year intervals is all that is necessary. Also, much unnecessary pruning can be avoided if trees and shrubs are selected carefully to fit their particular site.

The need for pruning should be anticipated early so that the cuts are small and as inconspicuous as possible. Large cuts take longer to close and are difficult, if not impossible, to camouflage. They may promote many suckers and bring about other undesirable effects.

Late winter or early spring, before growth begins, is probably the best general time to prune deciduous trees, some vines, roses, and certain types of shrubs. When the leaves are off, the outline or framework of the plants is in better view than later in the season, so that decisions regarding which branches or limbs must be removed are reached more easily. The cuts tend to close comparatively quickly in the spring. The bark on large trees is less susceptible to damage when pruning is done before growth begins; at this time there is least danger of bark peeling away around pruning cuts. Pruning during winter can be done more readily and safely in comparatively mild areas than in very cold ones. It is not advisable to prune while the wood is frozen, nor is it comfortable for the pruner and might prevent tha. deliberate consideration which is necessary for efficient pruning.

The correct time for pruning shrubs, and the manner in which it is done, depends greatly (as discussed in a subsequent section) upon the flowering season of the species. Generally, spring flowering shrubs should be pruned soon after flowering. This avoids the loss of the prospective bloom, and allows new shoots sufficient space to grow and produce flower buds for next year. Shrubs that bloom in late summer or fall on the current year's wood are best pruned in early spring. (See Appendix II.)

Trees such as maple, birch, walnut and mulberry, are said to "bleed" profusely when pruned during winter or early spring. If sap loss is excessive there may be a consequent reduction in the strength of the new growth; in addition, it is messy and objectionable. However, the bleeding stops as the season advances. Species that "bleed" badly are best pruned in early summer (See Appendix IV.)

The growth of plants slows down and ends in autumn so that there is no cambial growth and no healing of pruning cuts in the early and midwinter months. Therefore, pruning at this time has no logical purpose and may well result in injury. If ornamental trees and shrubs are pruned in autumn, species that are not entirely hardy may kill back so that further pruning is needed in the spring; thus the total reduction would be greater than intended. The severity of the winter cannot be forecast and pruning in fall may cause considerable damage to plants normally quite hardy, if the winter conditions are unusually severe.

How to Prune

Tools and Equipment

The basic tools required for pruning include pruning shears (secateurs), loppers and a handsaw (Figure 4). These tools should be sharp and correctly adjusted as ragged cuts do not repair as easily as clean cuts.

Twigs and branches up of 2.0 cm in diameter may be removed with the secateurs, whereas heavier limbs up to 5.0 cm in diameter are removed with loppers. Larger limbs may be removed with the hand pull saw. Professional arborists use similar equipment (Figure 5). However, the hand saws possess coarser teeth and require more clearance to easily remove larger limbs; lightweight chainsaws are commonly used in high tree work. Loppers may be attached to extension poles and operate by a pull rope enabling the pruner to reach the outer extremities of the tree crown. The pull saw may also be attached to an extension pole, which enables one to cut branches and limbs above shoulder height. Pruning saws possess cutting teeth that face towards the saw handle; thus it operates on the pull stroke, hence the name pull saw.

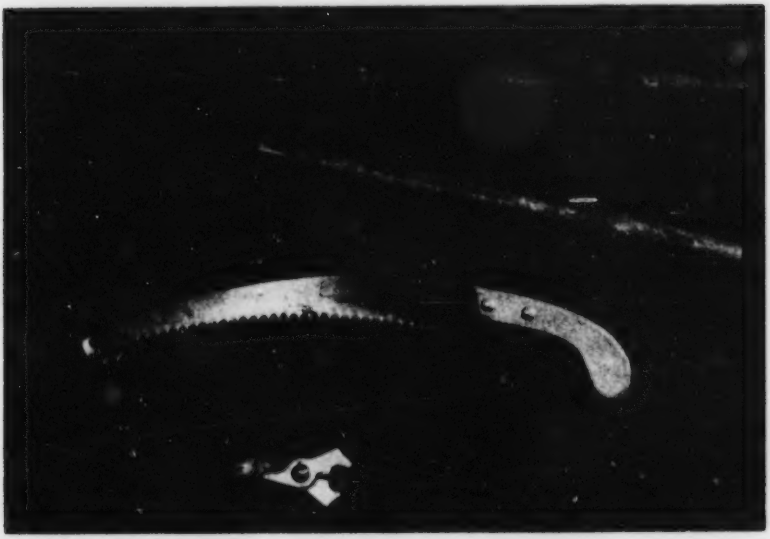

Figure 4. Pruning tools, top: loppers, middle: saw, lower: secateurs.

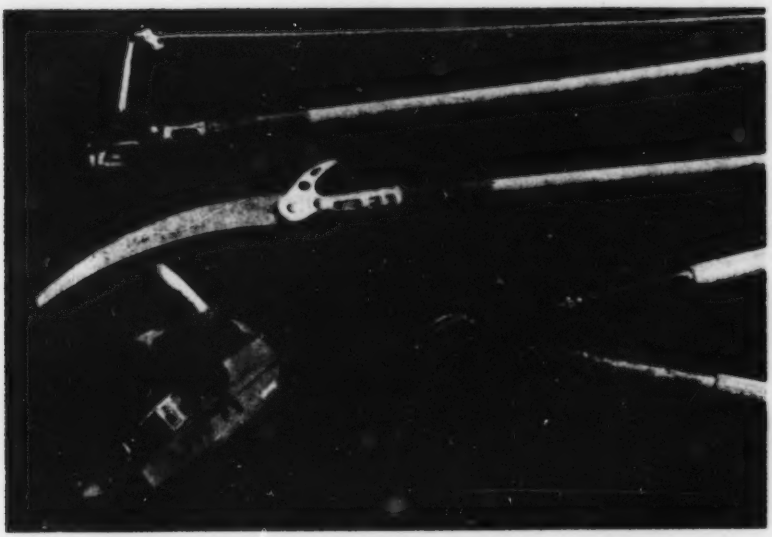

Figure 5. Background: pole loppers and saw. Foreground: chainsaw and loppers

Deciduous Trees

The pruning of deciduous trees, whether young or mature, requires a knowledge of tree structure and natural habit of growth for each species. The purposes the trees are to serve, whether for lawn specimens, shade trees, street trees, windbreaks, etc., all have to be considered. Because each pruning cut may remove wood that has taken from one to several years to reach its present state, it should not be undertaken lightly; in addition, the pruning done may have a beneficial or adverse effect throughout the life of the tree.

It is desirable to allow ornamental trees to grow in their natural form but some pruning must be done to correct faults and to ensure good branch structure. As the tree matures corrective pruning may be required; sucker growth at the base of the trunk should be removed; crossing and poorly spaced branches and those that form narrow crotches with the trunk should be removed. Branches forming wide angles with the trunk should be retained so that a strong framework of scaffold branches is established (Figure 6).

a) 1986 b) 1996

Figure 6. Diagrammatic representation showing a), scaffold limbs appear to be well spaced while the tree is young. However, when tree grows and trunks enlarge b) the spacing proves insufficient so that crowding and weak crotches occur.

The scaffold branches should be spaced far enough apart around the trunk, in compass direction and in height, so that there is adequate room for development without crowding. Figure 6 illustrates what happens as the branches grow when they are spaced too close together.

Small twiggy growths or branches on the lower portion of the trunk should be left for a time so that the leaves will assist in elaborating food material to aid the growth of the tree. However, these should be removed before they become large enough to leave obvious scars when they are eventually removed.

The lower branches of most shade and lawn specimen trees should be removed to a height of about 2 metres so that there is sufficient clearance for pedestrians to walk beneath them. A height of at least 4 metres is necessary for street trees where they overhang traffic lanes. Again, such branch removal should be done before they are old enough to leave unsightly scars.

On the other hand, there are some specimen trees such as the European hornbeam with a natural, low-branching habit so that branches sweep out from the trunk close to the ground. The natural beauty of these trees depends on this effect and where this type of specimen is natural and desirable no attempt should be made to remove the low branches.

Sometimes, after young trees have become well established they begin to develop competing leaders. If the two are left the tree will develop an undesirable form

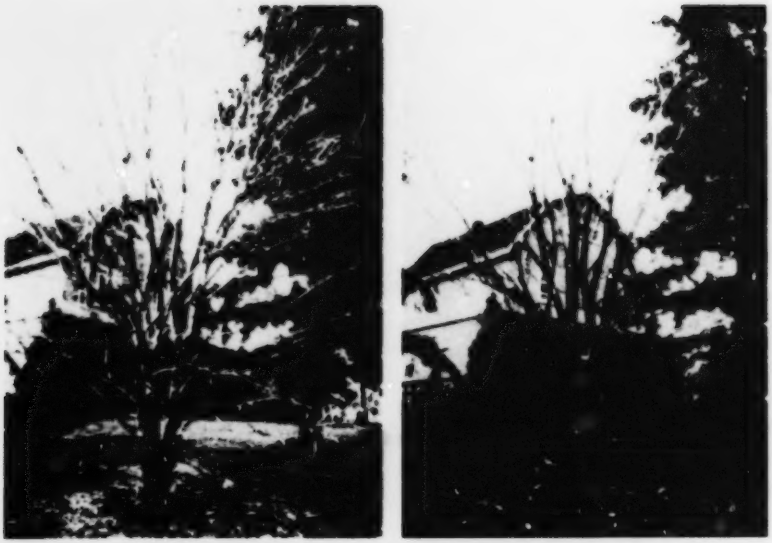

Figure 7. Left: Pruning Subject; Right: Drop-crotched tree.

and lose its symmetry. This tendency should be observed and checked early, and the least desirable of the competing leaders suppressed promptly by heading it back. Usually it is not desirable to remove it altogether.

If pruning is necessary to control the size of the tree after it has reached maturity, this generally indicates that a wrong choice in position, or in the species of tree, was made at the start. However, if neglect has caused serious irregularities in the structure it is better to make some attempt at correction, carrying out the program of removal of heavy limbs over a period of two or three years instead of a single drastic pruning operation.

Pruning large trees is not for amateurs. It is recommended that arborists, trained in tree climbing and correct safety procedures from firms with adequate insurance coverage, be employed for this work.

Reducing the height and width of a tree by cutting outward growing laterals, termed drop-crotching (Figure 7) is the most common method for pruning large trees. A poorer method is heading branches to short stubs or close to the crown. This latter type of pruning is termed "pollarding" (Figure 8). Pollarding defeats the overall purpose of pruning by encouraging numerous growths at the cut ends, destroying the natural form of the tree. It is often practised on small trees such as catalpa to encourage yearly rapid growth and very exotic-looking leaves.

When working on a large tree it is expedient to start at the top, removing broken, dead or diseased limbs and branches, and work down to the base. Thus, pruned branches caught up in other limbs can be easily removed as the climber moves downwards.

No limb of a tree should be cut off directly if it is heavy enough to tear the bark from the trunk below it. With large limbs it is necessary to make two preliminary cuts on the branch before removing it completely (Figure 9). The first cut should be made on the underside of the limb about 18 inches out from the trunk. The second cut should be made from the top of the branch about 2 inches farther out and should be carried through until the limb drops. Very large limbs may have to be steadied and lowered with a rope suspended over a higher branch. This will be essential for branches over power lines, roofs, fences, and shrub borders where falling limbs could cause damage. The final cut to remove the stub should be made on the branch collar which is indicated by a raised area of growth close to where the limb and tree trunk join (Figure 9). If stubs are left, they are certain to die because there is no flow of sap through them; then decay will set in which will extend into the trunk to form a cavity. The area of the branch collar contains chemicals and cells which promote rapid callous growth, and hence faster wound closure. If no branch collar exists, a cut flush with the trunk will suffice.

Extensive research over the past 10 to 15 years indicates that wound dressings are cosmetic, and do not contribute to rapid wound closure. In fact, it was demonstrated that they can be injurious to callous tissue. They are no longer recommended by tree pruning experts. Attending to the tree's requirements for nutrients and water will contribute more to rapid growth, healthy callous tissue and subsequent wound closure.

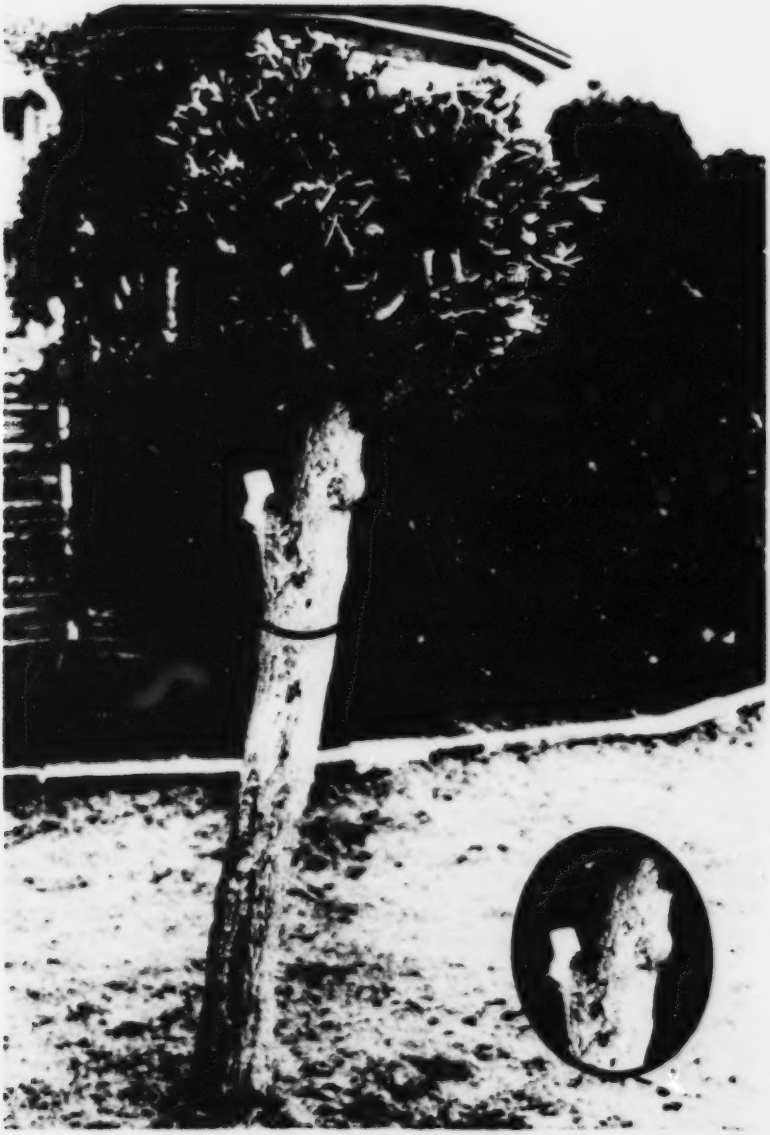

Figure 8. Pollarded tree, note dead stub attached to trunk and healing of branch collar (inset)

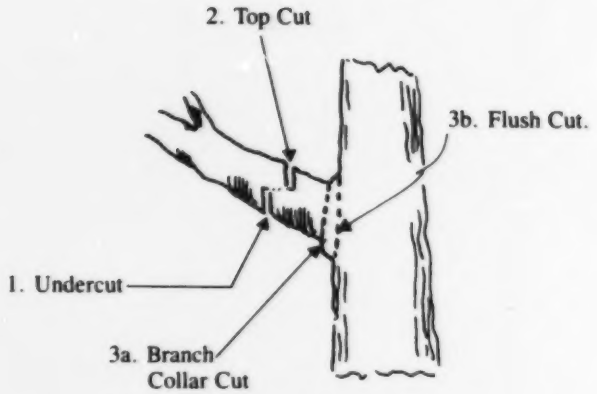

Figure 9. Jump Cut Method for Large Limb Removal.

Conifers

Coniferous plants may require pruning for some of the same reasons that other woody ornamentals require pruning, that is, to correct faults, and to maintain the symmetry and beauty of the specimen. Most persons consider it a violation to cut back or trim the beautiful new growth of coniferous evergreens such as junipers. Often it is good practice to do so; if the heavy foliage of spreading junipers is allowed to extend out too far it not only tends to encroach on other plants and smother them, but the branches are often broken under the strain of heavy snow in winter; in time, the center of the plant becomes open and rather bare and a sprawling octopus-like shape results.

Early pruning of the terminals in the young state is usually the best procedure, but a later adjustment can be made by undercutting and allowing fresh terminal growth to overlap the pruning cuts so that stubs are hidden from view (Figure 10). Evergreens of this nature should be pruned with great care, for pruning cuts that are badly made are irreparable.

Mature spreading junipers can be reduced in size by the aforementioned method; however, do not cut back to bare wood, since new buds on old wood cannot be regenerated as is the case with deciduous trees and shrubs.

Sometimes the leader of a pine or spruce tree is broken accidentally. A new leader may be trained in its place by selecting the strongest side shoot from the upper whorl, bending it upward carefully, and tying it securely to a stiff stake (Figure 11). Care should be taken to tie the string in a knot to the stake first, then loop around the new leader and gently pull it towards the stake, leaving space for the new growth expansion which is likely to be vigorous. It may be wise to make a

Figure 10a. Pruning large branch to an overlapping terminal growth held in pruner's left hand.

Figure 10b. Overlapping terminal growth when released by pruner will cover the pruning cut.

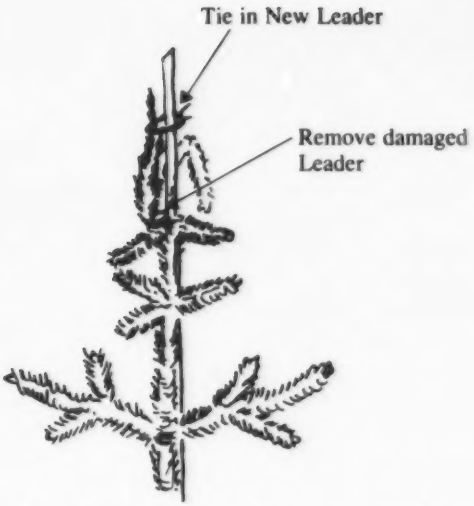

Figure 11. Prune Broken Leader and Train New Leader.

few adjustments from time to time. However, some spruce trees tend to form a new leader from the strongest of the topmost side branches without the necessity of staking. If the strongest shoot of the upper whorl is selected and any other that tends to compete is pinched at the tip, the dominance of the selected shoot is ensured.

Mugho pines differ considerably in habit and rate of growth, and the most desirable are the dwarf many-stemmed individuals. To maintain compact growth of some larger specimens, pruning may be necessary each year. Normally each branch makes a shoot or candle-like growth of 5 to 15 cm (2 to 6 inches). If warranted, about half of this growth may be cut off (Figure 12), otherwise the plant will grow with a loose habit. This is done in June when the candle-like growth is almost complete. At this time new buds will form immediately below where the cut is made.

If pruning is deferred until later in the summer, new buds will not form and unsightly stubs will be evident. Pruning older wood does not improve the habit of loose-growing specimens, as growth is not regenerated from old stems.

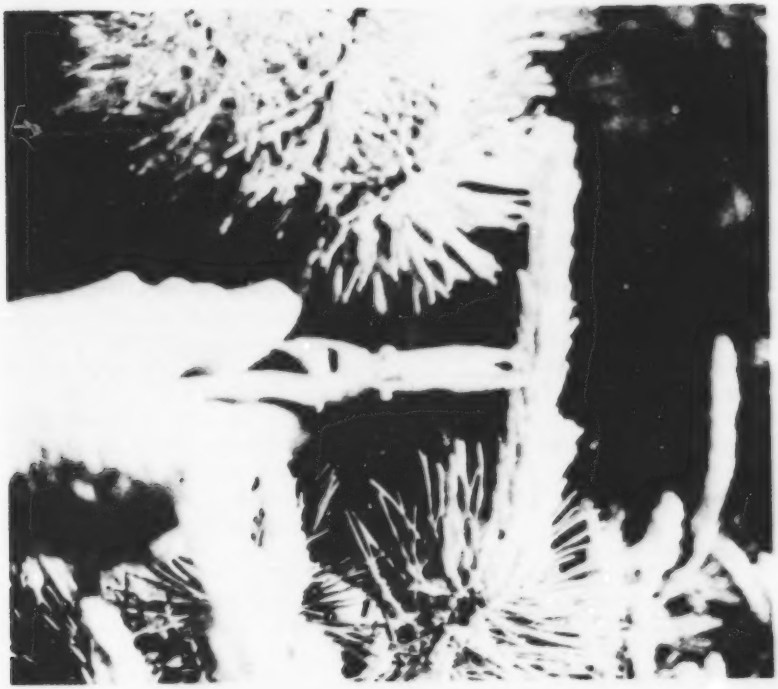

Figure 12. Candling Mugho Pine.

Certain young, dwarf forms of pine and spruce may be made more dense by removing the terminal buds of the strongest branches. This is called "plucking"; it forces the side buds to grow and also helps the weaker shoots to make more growth. The new growth should be pinched just after it has started.

Scots pines, grown for Christmas trees, begin to grow rapidly after about 4 or 5 years, so that the distance between the whorls of branches is too great to make compact and attractive Christmas trees. The leader may make as much as 60 cm of annual growth, whereas about 30 cm of growth is all that is desired. The leader may be pruned back to this height during the last week of June or the first week of July, and a cluster of new buds will form just below where the cut was made. It is desirable to make a slanting cut. The ends of the branches must be similarly pruned to about 20 cm. The pruning period is critical because at other times the stubs do not produce buds and will, therefore, die.

Similarly, spruce leaders accelerate in growth after 4 or 5 years, and pruning is necessary to make a compact and marketable tree. The leader may be pruned to

approximately 20 cm above the topmost branches and the ends of the lateral branches removed entirely so that no stubs are left. Pruning of spruces is not so critical as it is with pines and it may be delayed until later in the summer.

Established trees seldom require pruning except for the removal of dead or diseased branches or those with scant foliage. If the lower branches of fir, spruce and pine are removed the trees look unnatural. Evergreens do not send out sprouts and regenerate new growth as do most broad-leaved trees, so there is no way of replacing branches that have been removed.

The beauty of most of the tall upright spruces and firs lies in the whorls of branches that radiate like spokes in a wheel, tier upon tier, and in their tapering symmetry. The limbs should be left intact from the ground up so that this symmetry is not marred. If the wide-sweeping lower branches are removed the beautiful tapering effect is lost and the chief attraction of the tree is gone. Therefore, no entire branch should be removed from an upright evergreen unless there is good reason to do so.

If a branch needs to be shortened, as may happen if the tree is one-sided, the pruning should be done in spring, and should be restricted, if possible, to one year's growth. Such branches should be pruned to where a fork is formed by side shoots so that obvious stubs are avoided. If the branch is cut back beneath overlapping foliage and is heavily shaded, it seldom succeeds in growing out to the natural branch line. Careful pruning early in the life of a tree prevents the development of unduly long branches.

White cedar (*Thuja*), yew, and junipers that possess rather soft foliage can be shaped by shearing. This type of pruning may be done early in the growing season and again by midsummer, provided sufficient growth is made to warrant it. This method is primarily employed when the trees are being used in formal gardens or other formal developments, and for making young trees more dense. If an informal shape is desired, the tree should not be sheared more than twice, preferably when it is small.

The informal type of juniper frequently needs some branch pruning to keep it within bounds. The long branches are cut just above a vigorous side shoot. All the branches of the same length should be avoided as that would destroy the irregular, informal outline.

Broad-leaved Evergreens

Rhododendrons and Azaleas seldom require pruning for a number of years following planting, except for the removal of faded blooms to prevent seed development. The old flower heads should be removed carefully so that the growth buds immediately below them are not injured.

Sometimes long branches develop and tend to spoil the symmetry of a plant. These occur when some shoots end in vegetative buds rather than in flower buds. It is easy to distinguish between them because the flower buds are swollen and much larger than the vegetative ones. Shoots with vegetative buds at the ends continue to grow in length but if the terminal bud is pinched out better branching

is obtained. On the other hand, a terminal flower bud ensures that branching will occur below the inflorescence. Where long branches have already developed they may be cut back to a suitable whorl of leaves. New growth from the dormant buds in the axils will occur to ensure a better branched specimen. Old leggy branches may be rejuvenated by pruning the branches close to a whorl of leaf scars from which new growth will start. This is done in early spring.

Few broad-leaved evergreen shrubs are reliably hardy in this province but a number are planted in the milder areas. These include boxwood (*Buxus*), rose daphne (*Daphne cneorum*), Paxistima (*Paxistima canbyi*), firethorn (*Pyracantha*), hollygrape (*Mahonia*), *Ilex* species, and *Euonymus fortunei* cultivars, as well as a limited number of barberries (*Berberis* species).

These plants are usually received as balled and burlapped or container grown specimens from nurseries, and should be pruned back lightly at planting time to aid them in the establishment process. Subsequently, little pruning is required except for shortening straggly growths and removal of winter-injured or dead branches. Wintercreeper (*Euonymus fortunei vegetus*), is frequently planted as grafted standards, which do not require much pruning. However, straggly growths should be cut back to maintain shape and suckers from the stem should be removed. Because these plants are usually prominent specimens, care must be taken to hide pruning stubs.

Some low-growing evergreen shrubs such as periwinkle (*Vinca minor*), Japanese spurge (*Pachysandra terminalis*), bearberry (*Arctostaphylos uva-ursi*), Baltic ivy (*Hedera helix* 'Baltica'), and cultivars of *Euonymus fortunei* are planted as ground cover. Low maintenance is a prime requirement for ground cover plants and the majority require little or no pruning. Sometimes rampant growers may extend beyond their allotted limits, or may climb up other shrubs, and in such cases some cutting back may be required to preserve neatness and prevent smothering.

Deciduous shrubs

Deciduous shrubs are grown chiefly to get the maximum flower or foliage effect along with desirable form for the particular location they occupy. The form desired of most deciduous shrubs is that of a low-branched plant with the branches coming from the base or close to it, and not from a single main stem or trunk. High-branched shrubs soon become leggy and of poor appearance; therefore, pruning of shrubs should be partly to encourage desirable form as well as to get the best flower and foliage production.

The common but misguided practice of trimming shrubs with hedge shears to produce rounded heads spoils the natural form of the plants and destroys the aesthetic effect. In addition, such indiscriminate shearing destroys much potential flowering wood and encourages branches at the top of the plant. Another common custom is to remove all the low branches and those that arch over or near the ground so that a mower can be run beneath them and up to the base of the shrub. Again, this destroys the symmetry and exposes leggy and unsightly bases. A flowering shrub with arching branches full of bloom to ground level is a beautiful garden

picture and nothing should be done to destroy this effect. If it is necessary to mow beneath them, the branches can be raised with a rake handle or rope.

When and how a shrub should be pruned is determined by the kind of wood on which the flower buds are formed; it is important to know this so that the best effects are obtained. Shrubs fall into two groups: (1) those that form their flower buds on shoots arising from previous years' wood; and (2) those that bloom on shoots made during the current growing season (see Appendices).

All the spring- and early summer-flowering shrubs produce their blooms on growths made in previous years. This is by far the largest group; it includes such well-known shrubs as forsythia, viburnum, deutzia, bridal wreath spirea and mock orange. All these should be pruned immediately after flowering but because of different growth rates they may require different treatment, depending on the habit and growth of the individual bush. Some vigorous growers require pruning each year; others may require it at 2 or 3 year intervals, and some may require pruning only occasionally. If berry production is desired, as with elderberry, snowberry, high-bush cranberry, and firethorn, prune only as needed to maintain a reasonable proportion of strong replacement shoots.

Forsythia's are vigorous growers that tend to become too dense unless some old wood is thinned out annually after flowering. Old wood, more than two years old, should be cut out near the base. This not only helps to open up the plant and makes more light available to the central shoots, but it encourages the development of new branches for subsequent bloom production and keeps the bush refurbished with young wood. Bridal wreath (*Spiraea vanhouttei*) and other early flowering species should also be rejuvenated in this manner but may not require it so frequently. Many other spring flowering shrubs require similar treatment if they are to be kept in desirable form and provide maximum bloom production.

Viburnums, on the other hand, are less likely to produce a dense mass of branches and so do not require the annual thinning out necessary for shrubs that grow in the above manner. However, branches that make abnormal growth so that the shape of the bush is likely to be spoiled, or that encroach too far on neighboring shrubs, should be removed or cut back after flowering.

Young lilacs seldom require pruning for several years. However, the appearance is considerably improved by removing the old flower clusters when they have faded. As they age, some of the oldest branches may be thinned out so that they can be replaced by new growth. All suckers from the base of grafted plants should be removed.

Summer and fall flowering shrubs bloom at the ends of branches grown during the current season. This group, although much smaller than the previous one, includes such well-known shrubs as *Hydrangea*, *Spiraea bumalda*, *Caryopteris*, *Buddleia*, and lesser known kinds such as *Perovskia* and *Elsholtzia*. These shrubs should be pruned early in spring before growth starts. This is accomplished by pruning last year's growths back to two to four buds from the base. The new growths from these buds will provide the shoots on which the flowers will be borne. Usually the weakest growths can be removed entirely without impairing flower production.

Although the rose of Sharon (*Hibiscus syriacus*), flowers in late summer, its habit of growth is such that it must not be pruned in the same manner as the others in the group. It seldom requires pruning. If it becomes too dense some of the old wood may be thinned out of the center in early spring. Witch hazel is another late-flowering shrub that seldom requires pruning and is handled in a similar manner.

Some shrubs such as *Kerria japonica* and *Sorbaria sorbifolia*, spread rapidly by means of suckers that arise from buds developed on long, spreading roots. If these are left undisturbed they form masses of stems with few flowers and contain a considerable number of dead twigs. These dead branches should be removed and some thinning out of the weakest branches should be done. These masses of branches spread beyond the area allotted to them and encroach on other shrubs. Suckers appearing beyond the area allotted to these plants should be pulled or dug out at their point of origin. With such plants, occasional inspection is necessary so that unwanted suckers may be removed as soon as they appear.

Another source of suckers is the roots of grafted or budded plants. Many shrubs and ornamental trees are propagated in this way; therefore, the rootstock is of a different plant than the upper part of the shrub or tree, and growth arising from the roots will be identical with the rootstock. Usually, suckers are more vigorous than the grafted plant and when they are allowed to grow unchecked, the desired variety is seriously weakened and often dies out entirely. Growth arising below the bud or graft union should be pulled out as soon as it is observed.

Shrub Rejuvenation

In many gardens both specimens and groups of shrubs are left to grow year after year without pruning, until they ultimately become very dense, high branched, leggy, and generally unattractive. In addition, the display of bloom is much poorer than is expected from plants that receive normal or even occasional pruning treatment. The problem then is to rejuvenate them and restore them to normal size, attractive appearance, and bloom production.

A very drastic treatment sometimes employed is to cut them back close to the base. This, however, prevents them from flowering for a 2 year period at least, and for the first year they are likely to be decidedly unattractive. A better system is to renovate them over a period of about three years. This can be accomplished by selectively thinning out, near to the base, about one-third of the old wood each year (see page 9). Some of the tallest stems remaining can be shortened to suitable laterals. Eventually, all of the old wood will have been replaced by young healthy branches that will produce the maximum floral effect and desirable shrub form. Renovation of old neglected shrubs is best carried out in spring before growth starts, so that the new shoots formed have a full growing season ahead of them.

Two shrubs, the yellow and red-twigged dogwoods (*Cornus* sp.) are specifically grown for their bark color, which dulls with age. These can be cut back to within 15 cm of the base in early spring prior to active growth (see page 9). New growth produces the bright yellow and red branches for winter contrast with snow. Repeat the process every four to five year.

Vines

In many cases, some pruning of vines is necessary to keep rampant growers within bounds and to prevent vigorous self-clinging kinds from encroaching on windows, roofs and other objects. Since some tend to become tangled together, proper distribution of growth is required to ensure an effective display of foliage and bloom. In others, growth must be directed to cover trellises, arbors, pillars, and other supports, and some pruning is usually desirable. However, climbing vines vary a great deal so that general directions cannot be applied to all of them. Pruning instructions for some of the most common kinds are given separately.

Many vines are sold in pots or containers, and others are balled and burlapped. In these cases there has been little or no root injury, and there is no need to reduce the top growth as it is already in balance with the root system. The new shoots can be trained in the direction they are to grow without pruning. Some twining kinds such as Dutchman's pipe may have the growths twisted around each other and around the stakes supplied for support, and it may not be possible to disentangle them without some pruning. When they are entwined in this manner they should be cut back to suitable buds so that the new growths can be trained in the desired direction (Figure 13).

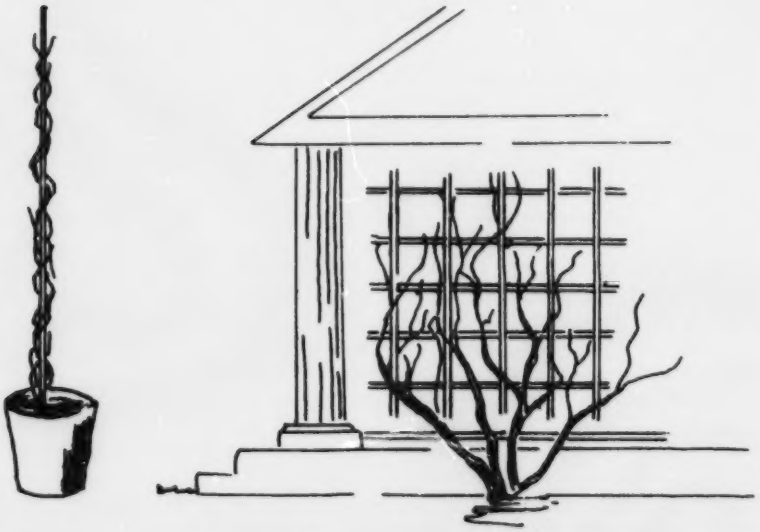

Figure 13. Container grown 2–3 year old vines of Dutchmans pipe with their stems intertwined (left). Cut them back severely and train into a fan shape (right).

It is necessary to cut back the stems of the self-clinging kinds such as Boston ivy and Virginia creeper to 2 or 3 buds from the base because the old growths do not attach themselves to the objects they are to cover. Tendrils with the disk-like tips for attachment are formed on the new growths, and these can then cling to the supports.

Established woody vines such as Virginia creeper and Boston ivy require occasional pruning to prevent them from overgrowing windows and other features. The disk-like tips of the tendrils leave unsightly marks on window screens and woodwork, so it is desirable to cut encroaching growths out. This can be done at any time. Sometimes old stems become loose and these should be cut back to firm support. It may be necessary occasionally to cut the whole plant back to near the bottom. This can be done in early spring and the plant will then be renewed from young growths.

English ivy renews its growth readily following pruning, and can be handled similarly to prevent it from invading windows and woodwork. Loose ends and shoots that have been winterkilled should be cut back. *Euonymus fortunei vegetus*, the popular big-leaf wintercreeper, attaches itself to walls in the same manner as English ivy. It seldom requires pruning except to cut back unwanted young growths. As the old stems thicken, they are forced away from the wall, and need to be tied to some support to prevent the whole plant from becoming loose.

Hydrangea petiolaris is a vigorous climber that flowers profusely in early summer and is often grown on walls and even on trees. Growths interfering with windows and woodwork should be cut back. The old flower trusses should be removed when the flowers fade. Some of the growths projecting farthest from the wall should be shortened at this time. The flower buds for the next year are set early and may be easily recognized from vegetative buds by their plumper appearance.

Trumpet creeper (*Campsis radicans*), is a self-clinging vine that flowers in late summer at the ends of the current year's growth. All shoots that are not required to cover vacant wall space should be cut back to 3 or 4 buds in early spring. Suckers tend to grow freely from the roots of old plants and should be removed.

Established plants of *Wisteria* grow long shoots each season and these should be pruned back to 5 or 6 buds in July. It is from these buds that the flowering spurs are formed. Clematis vines are normally shipped in containers and do not require pruning at planting time, but in succeeding years they should be pruned according to their flowering habit and the requirements of their location.

The pruning of Clematis vines depends upon whether the flowers are borne on the previous year's wood or upon wood produced during the current season. Early-flowering cultivars that flower on the previous year's wood are: "Belle of Woking" and "Duchess of Edinburgh". The only pruning necessary is the removal of dead, broken or weak shoots. "Barbara Dibley", "Lasurstern", "Nelly Moser", and "The President" may be pruned similarly. A number of the large flowered cultivars produce their blooms on the current season's growth and are consequently later in flowering than the previous group. They may be pruned back to live buds near to the base in early spring; if there is any difficulty in recognizing dead wood,

leave pruning the vines until new growth appears. Stems can be pruned at different heights, depending upon the severity of the winter, from 1.5 m to near the base. The resulting growths will cover a large area and provide an excellent show of bloom.

It is wise to train the growths in the direction they are required to grow by tying them in lightly here and there; otherwise Clematis tends to become a jumbled mass. Cultivars such as *C. jackmanii*, "Comtesse de Bouchard", "Crimson King", "Lord Neville", "W.E. Gladstone", "Lady Betty Balfour", "Huldine", and "Ville de Lyon" are pruned in this way. The species *C. paniculata*, the sweet autumn clematis, is pruned hard back in early spring.

Climbing roses received from nurseries are usually 2 year-old plants with the canes shortened for convenience in shipping. If they are planted in fall it is best not to prune them but to protect them well over winter; in spring they can be cut back to 5 or 6 buds from the base.

Climbing roses vary greatly, depending on the cultivar, and pruning must be practised according to the amount of growth and manner of blooming. Most of the climbers growing in Ontario bear their flowering wood on canes grown the previous year. With this type the old thick canes should be removed and young growths from the base trained up to replace them. This is best done immediately after flowering. Where there are few new growths, 2 or 3 of the old canes may be left but new growths should be encouraged so that the old ones can be replaced as soon as possible.

Hedges

Pruning is the most important cultural factor in the maintenance of hedges, for if this is not attended to with some regularity, they soon present a ragged and unkempt appearance. In the majority of cases hedges are of a strictly formal type requiring trimming annually, or even more frequently, depending on the rapidity of growth of the individual species. A large number of evergreen and deciduous species, are used for such hedges and are amenable to trimming.

In some cases shrubs may be planted close together in a row to perform the function of a hedge but are allowed to grow in a more or less natural manner, with some removal or shortening of branches to prevent very straggly growth. In these informal hedges strict uniformity of shape is not desired. Many flowering shrubs of suitable height and growth characteristics are used for informal hedges. This provides a bonus to their hedge function with an impressive display of bloom during their flowering season.

Only small plants should be set out for hedge purposes so that they can be trained from the beginning to form dense bushy plants, well branched at the base. Older and taller plants that have not been severely pruned in their early growth period are seldom low-branched enough to avoid having open spaces or gaps near the ground. This spoils the appearance of any hedge. It is therefore necessary to prune newly-set plants severely to promote new dense growth near ground level.

Deciduous shrubs such as privet, alpine currant, etc., must be cut back to within 15 cm from the base to make them produce new growth. If they are pruned lightly

only the buds near the top are forced into growth and the objective of new shoots near the base is not realized. This is why older plants that have not been subjected to hard pruning are unsuitable; they can seldom be cut hard enough to ensure this result and it cannot be attained later. Most young evergreens do not require such drastic pruning, as they are usually well branched from the beginning. However, some initial pruning for balance and height may be necessary.

The ultimate or desired height of a hedge should be decided before the plants are purchased so that a suitable species is selected. The hedge can then be pruned regularly so that it is compact and of desirable form when it reaches this height. Leaving a young hedge to grow to the final height before trimming is a mistake made all too often because low branching and dense compact growth canot be achieved; also, it is difficult to shape it to the desired form. This must be done by pruning it as it grows.

Figure 14. Hedges. Royal Botanical Gardens correctly trimmed narrower at the top than at the base.

The best form for a hedge is wider at the bottom than at the top (Figure 14). This gives it the best chance of remaining dense right to the ground because the lower portions get an equal amount of light. For evergreens this is particularly important since shading causes the lower branches to become thin and to die out eventually, thus leaving gaps impossible to fill again.

A rounded or cone-shaped top is the most desirable, but more difficult to maintain uniformly than one with a level top. There is less chance of snow injury, but this is not likely to occur unless a hedge is allowed to become too wide at the top and is not dense enough.

Hedges with vertical sides are satisfactory, provided they are vigorous growers and pruned to ensure a well filled out base. Suitable vigorous and erect growers are to be found among both deciduous and evergreen shrubs.

When a hedge is allowed to develop wider at the top than at the base it soon becomes necessary to take remedial action by replacing it entirely, or cutting it back very hard, which is feasible with many deciduous hedge species.

Trimming a well-established hedge is a simple matter. It can be done by anyone provided the clippers are sharp and in good working condition. To ensure uniformity of line and equal height throughout it is wise to use two stakes with a line between them as a guide for clipping. Bulges can be corrected by trimming a little closer and indentations may be filled out by trimming lightly.

The time to trim a hedge depends on the species, its condition, and its rate of growth. Some hedges may require trimming only once a year while other more vigorous growers may require it two or three times. The number of shearings may depend on how neatly the owner wants it kept. However, shearing too often reduces the leaf surface drastically. It limits the supply of plant food available and eventually has a weakening effect.

Trimming a deciduous hedge while it is dormant is seldom the best time unless a drastic cutting back is required to rejuvenate an old hedge. It is more difficult to trim at this time because the wood is mature and harder to cut. However, it may be necessary if a hedge has been neglected and allowed to make a season's growth without trimming, or to alter the shape.

Most hedges are trimmed after some growth has been made; therefore, it is only new growth that is being cut. With vigorous growers such as privet the easiest time to trim is when the shoots have not yet become hardened at the base, and the flower buds have formed at the ends of some of the shoots. New growth will start immediately and trimming will be required when it gets to the same stage again; a light final shearing may be given in early September to tidy it up for the year. Most deciduous hedges, however, can be adequately taken care of with one trimming in early summer and a final shearing early in September.

Flowering hedges are pruned immediately after flowering by removing some of the oldest branches entirely and cutting back others that are excessively long to prevent the hedge from becoming straggly. However, pruning must be done selectively and carefully to preserve a natural appearance. Hedges formed from shrubs that bloom at the end of the current season's growth such as the summer-flowering spirea (*Spiraea bumalda* and its cultivars), should be pruned back to a few inches

from the ground in early spring before growth starts. Where floribunda roses are used as a low, flowering hedge they also are cut back to suitable buds in spring, the same as their garden counterparts.

Evergreen hedges normally require only one pruning during the year since growth is slower and they do not make as much shoot growth as deciduous shrubs. Also, growth begins later in the season. Only the current year's growth should be pruned because new growth seldom starts, if at all, in sufficient time to cover up the pruned surfaces. Trimming an evergreen hedge can be done after growth is well under way in early summer. When it is done at this time the sheared surfaces are soon covered up by new growth. However, the trimmed effect is not long maintained. An alternative is to prune in late summer. At this time the hedge will remain uniformly trimmed until new growth is produced next year; this has an advantage in that a tidy appearance is preserved for most of the year.

Sometimes hedges become old and neglected or become too tall and too wide to be trimmed except with great difficulty. Privet and similar shrubs can be cut hard back to 30 to 38 cm from the ground in spring just before growth starts. This is not an easy job but with the use of heavy loppers, and occasionally a pruning saw for the thickest branches, it can be accomplished without too much difficulty. New growth will soon appear and a new, more manageable hedge will be obtained.

Old evergreens cannot be rejuvenated in this way and it is best to remove such a hedge and replace it with young plants.

Appendix I.

SPRING FLOWERING TREES AND SHRUBS WHICH SHOULD BE PRUNED AFTER FLOWERING

Scientific Name	Common Name
Amelanchier	Shadblow, Serviceberries
Azalea	Azalea
Berberis	Barberry
Caragana	Pea shrub
Cercis	Redbud
Chaenomeles	Flowering quince
Cornus kousa	Kousa dogwood
Cornus mas	Cornelian cherry
Crataegus	Hawthorn
Deutzia	Deutzia
Exochorda	Pearlbush
Forsythia	Forsythia
Kalmia latifolia	Mountain laurel
Kolkwitzia amabilis	Beautybush
Laburnum vossi	Laburnum
Ligustrum	Privet
Lonicera	Honeysuckle
Magnolia	Magnolia
Malus	Crabapple
Philadelphus	Mock Orange
Pieris	Andromeda
Pyracantha	Firethorn
Prunus	Flowering cherry, almond and plum
Rhododendron	Rhododendron
Rhodotypos scandens	Black jetbead
Rosa	Climbers and shrub roses
Sorbus	Mountain Ash
Spiraea thunbergii	Thunberg spirea
Spiraea vanhouttei	Vanhoutte spirea
Syringa	Common, Chinese and French lilacs
Viburnum burkwoodii	Burkwood Viburnum
Viburnum carlesii	Korean spice Viburnum
Viburnum lantana	Wayfaring tree
Viburnum opulus	European cranberry bush
Viburnum plicatum tomentosum	Doublefile Viburnum

Appendix II.

SUMMER FLOWERING TREES AND SHRUBS WHICH SHOULD BE PRUNED BEFORE SPRING GROWTH BEGINS

Scientific Name	Common Name
Acanthopanax	Aralia
Abelia grandiflora	Glossy Abelia
Aesculus parviflora	Bottle brush buckeye
Buddleia	Butterfly bush
Cotinus coggygria	Smokebush
Hibiscus syriacus	Shrub-althea, Rose-of-Sharon
Hydrangea	P.G. Hydrangea Annabelle, Snowhill
Hypericum Kalmianum	Goldflower
Kerria japonica	Japanese Kerria
Koelreuteria paniculata	Goldenrain tree
Potentilla fruticosa	Cinquefoils
Ribes odorata	Flowering currant
Rosa	Hybrid tea, grand-flora, floribunda
Sambucus	Elderberry
Sophora japonica	Japanese Pagoda Tree
Sorbaria	False Spirea
Spiraea x bumalda	Bumalda spirea
Spiraea japonica	Japanese spirea
Tamarix	Tamarisk

Appendix III.

TREES AND SHRUBS WHICH MAY BE PRUNED BOTH BEFORE AND AFTER BLOOM

Scientific Name	Common Name
Cornus stolonifera	Red Osier dogwood
Cotoneaster apiculata	Cranberry cotoneaster
Cotoneaster divaricata	Spreading cotoneaster
Cotoneaster multiflora	Multiflora cotoneaster
Mahonia aquifolium	Oregon hollygrape
Spiraea bumalda	Anthony Waterer and Frobel spirea
Symphoricarpos albus	Snowberry
Symphoricarpos chenaulti	Chenault coralberry
Weigela florida	Rose Weigela

Appendix IV.

PLANTS THAT BLEED WHEN PRUNED IN SPRING

Scientific Name	Common Name
Betula	Birch
Parthenocissus tricuspidatus	Boston Ivy
Robinia pseudoacacia	Black Locust
Laburnum	Golden Chain Tree
Vitis	Grape
Carya	Hickory
Gleditsia	Honey Locust
Sophora japonica	Japanese Pagoda Tree
Gymnocladus dioicus	Kentucky Coffee Tree
Magnolia	Magnolia
Acer	Maple
Morus	Mulberry
Populus	Poplar
Tilia	Linden
Liriodendron tulipifera	Tulip Tree
Parthenocissus quinquefolia	Virginia creeper
Juglans	Walnut
Cladrastis luteus	Yellowwood

Appendix V.

SHRUBS THAT CAN BE DRASTICALLY PRUNED IN SPRING

Scientific Name	Common Name
Acanthopanax	Aralia
Berberis	Barberry
Kolkwitzia amabilis	Beautybush
Rhodotyphos scandens	Black jetbead
Potentilla	Cinquefoil
Symphoricarpos	Coralberry
Deutzia	Deutzia
Cornus alba C. sericea	Dogwood
Sambucus	Elderberry
Sorbaria sorbifolia	False Spirea
Ribes odorata	Flowering Currant
Forsythia	Forsythia
Hypericum kalmianum	Goldflower
Lonicera	Honeysuckle
Hydrangea	Hydrangea
Kerria japonica	Japanese Kerria
Philadelphus	Mock Orange
Ligistrum	Privet
Caragana	Pea shrub
Symphovicarpor albus	Snowberry
Spiraea	Spirea
Tamarix	Tamarisk
Weigela	Weigela